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A New Panamanian Caecilian¹

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In the summer of 1966 I visited the Canal Zone and other parts of Panamá with the intention of exploring for caecilians. Mr. Charles Myers, then of Gorgas Memorial Laboratory, provided me with transportation and accompanied me to the ancient volcano now called El Valle de Antón, in the crater of which is the village of Antón, in the province of Coclé.

Caecilians were discovered here in a small swampy area not far from our hotel. In order that this form may be distinguished easily from the other caecilians of Panamá, I append a short key to follow the description.

I desire to acknowledge my indebtedness to Mr. Myers for his very considerable help and numerous courtesies.

*Caecilia volcani*³ sp. nov.

(Figs. 1-4)

HOLOTYPE. Edward H. Taylor - Hobart M. Smith (EHT-HMS) Coll. No. 4689³. Collected at El Valle de Antón, Coclé, Panamá (elev. 550m) by Edward H. Taylor and Charles Myers, July 11, 1966. Topotypic paratypes 4690-4697, same date and collectors.

DIAGNOSIS. A medium small swamp-dwelling caecilian reaching a known length of 324 mm; tip of snout truncate; eyes visible externally, slightly raised, in a socket; tentacle emerges below and slightly in advance of nostril, not visible from above, closer to mouth than to nostril; primary folds, 112-124; secondary folds, 14-32. Primaries complete dorsally only on the first three centimeters following collars, and in last two centimeters preceding the terminus. Folds incomplete below except on last two centimeters. The terminus transversely pinched (flattened). Premaxillary and prevomerine tooth series with group loss and replacement. Tongue with narial plugs; splenial teeth present.

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³ Named for Volcanus, god of fire.

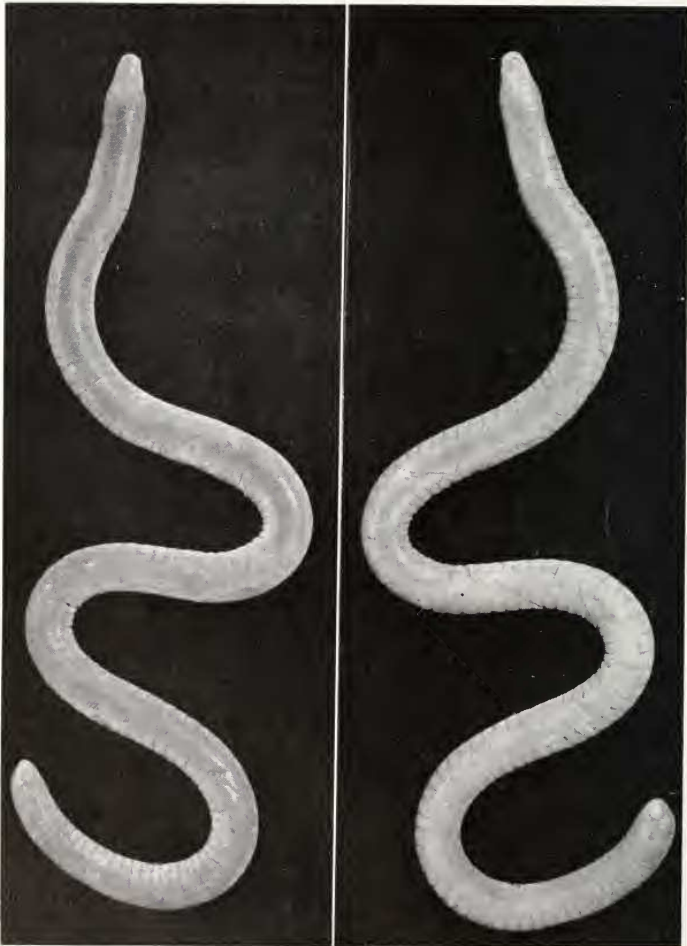


FIG. 1. *Cacilia volcani* sp nov. EHT-HMS Coll., No. 4689 ♂. Type. Dorsal and ventral view. Actual length of specimen, 320 mm. El Valle de Antón, Coclé, Panamá.

DESCRIPTION OF THE HOLOTYPE. The total length 320 mm, the body width in length 30.5 times. Head somewhat truncate, the nostrils well visible from above, the greatest width of head at first nuchal groove, 7.6 mm, while width

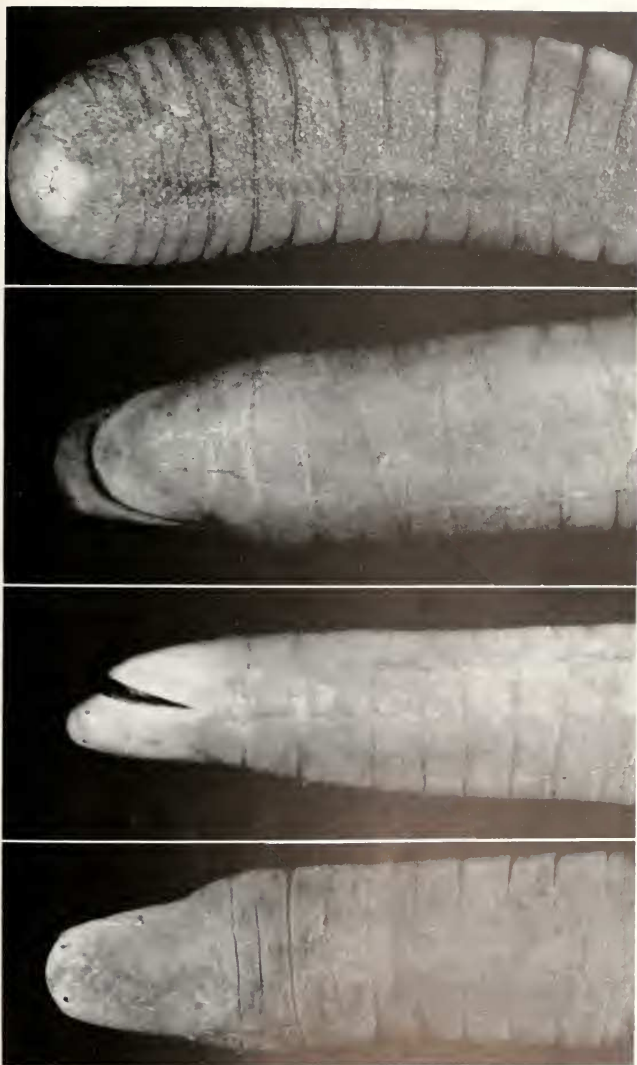


FIG. 2. *Caeilia volcani* sp. nov. Type. Dorsal, lateral and ventral views of head and neck; ventral view of subcaudal area. Head width at first groove, 7.6 mm.

at nostrils is 5.2 mm; tentacular aperture below and slightly in advance of nostril. Eye distinctly visible, in a socket, the distance from the tentacular aperture, 3.6 mm; tentacle to nostril, 1.4 mm; eye to nostril, 3.7 mm.

First nuchal collar delineated by the first nuchal grooves, clearly defined below, less distinct dorsally; a short dorsal transverse groove on collar. Second collar defined by the second and third nuchal grooves, but third groove broken below permitting a fusion of second collar with first primary fold. Second collar much wider than first. Following the collars are 124 primary folds, 32 secondary folds (counting from first appearance, even though an occasional one may be missing). There are three complete or almost complete secondaries.

Vent transverse with about seven irregular denticulations preceding and a similar number following vent. Two of the anterior denticles bear small rounded moundlike anal glands; distance of vent from body terminus, 2 mm; width of body one-half cm from terminus, 9.6 mm.

Dentition. Premaxillary-maxillary tooth series, 12-1-12, three alternating teeth on each side of premaxillaries missing but being replaced by teeth developing in the gums; prevomeropalatine series, 9-1-9, with three alternating teeth on each side of middle being replaced. Dentary teeth, 10-10, the anterior the largest in mouth, while posterior dentaries are minute; splenial teeth, 2-2, small. The tongue has two well-defined narial plugs, area between them and area behind them striate longitudinally. Choanae subcircular, the diameter of one, in distance separating the two, about two times.

Scales. These begin in the folds near middle of body; a few at first, then a single row of scales. Near terminus, scales distinctly larger, subquadrangular, overlapping toward middorsal scale (about 18 large scales in one fold); those on ventral parts somewhat smaller than dorsals. These scales in thin tissue pockets. Laterally on body, even anterior to the scales in folds, there may be small scales in connective tissues beneath skin. These are nearly circular, the largest being about 0.3 mm in diameter (see Figs.).

Color. Uniformly slate, vaguely grayer on head and neck; underside of snout and edges of lips lighter gray. A vague light spot about eye, one in front of nostril and one at aperture of tentacle. Ventral surface of body grayish slate, somewhat darker in median ventral region. Narial plugs on tongue dark, nearly black.

Measurements in mm. Total length, 320; head width, 7.6; body width, 10.5; width in length, about 30.5 times; snout tip to first groove (lateral), 8.6; to second groove, 12.4; to third groove, 17.

Skull characters (from a paratype). Skull characteristics from the cranium of EHT-HMS, No. 4696, topotypic paratype. The skull roofed by a nasopre-maxillae, frontals and parietals, together with a median mesethmoid which completely separates frontals and pushes between posterior parts of naso-

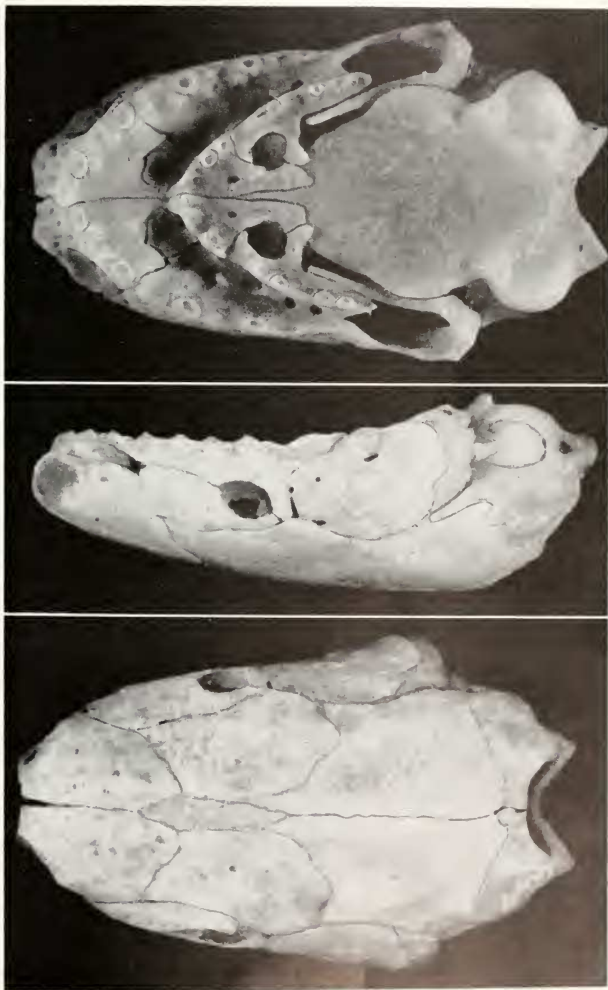


FIG. 3. *Caecilia volcani* sp. nov. EHT:UIMS Coll., No. 4696 ♂, topotypic paratype. Dorsal, lateral and ventral views of skull. Actual skull length, 8.5 mm; greatest width, 5.1 mm.

premaxillae and anterior parts of parietals. Foramen magnum surrounded by a compound bone, the basisphenoid, sutured between parietals and the foramen.

Lateral to these bones are, in sequence, the maxillopalatines, squamosals, and quadrates. The stapes, which lie against the basisphenoidal wall of posterior part of brain case and against otic capsules, attach to quadrate. The otic capsules are inflated. There is a fine suture running from orbit of the eye to tentacular aperture which seems to separate off a prefrontal, but both the part above suture and that below seems to be solidly a part of maxillopalatine. I have not noted this condition in skulls of other species of *Caecilia* that I have examined.

Ventral surface shows two nasopremaxillae extending back from premaxillary teeth almost reaching prevomerine teeth. Immediately behind these are two rather reduced prevomers with two irregular processes anterior to prevomerine teeth, and pushing back between and bordering the inner sides of the internal nares. Remainder of the nares bordered by palatal shelves of maxillopalatines. Pterygoid extends forward along palatine shelf but is separated from basisphenoid by narrow diastema. Basisphenoid has an elongate spine forward separating prevomers for more than half their length. It widens where in contact with the pterygoid and quadrate, behind which is a constriction.

Measurements, in mm, of the skull and the tooth counts are given here-with: Total length, 8.5; greatest width, 5.1; width of skull at orbit, 4.15; jaw length, 7.0; total length of basisphenoid, 5.6; width at wings, 3.4; width behind constriction at otic capsules, 3.5; length of prevomers, 2.5; their combined width, greatest, 1.9; premaxillary teeth, 4-3; maxillary teeth, 6-6; prevomerine teeth, 3-3; palatine teeth, 5-5; dentary, 11-11; splenial, 1-1.

REMARKS. El Valle de Antón is an ancient volcanic crater. The village occupies the basin, which is relatively flat. In the eastern part of the town a small stream drains from the higher hills to the north. Along this narrow valley is a road. At one point a small swamp drains into the stream, the water dribbling down the relatively low bank. The swamp was covered with a heavy growth of a giant grass resembling wild sugar cane. The specimens of caecilians were dug out of the soft mud bank. Some individuals fell into the water and escaped.

The relationship of the species may presumably be with *C. degenerata* and *C. orientalis*. One of the significant differences is the presence of well-developed secondaries and the general characteristics of the squamation. Subdermals have not been demonstrated in the two other species mentioned, and scales in folds may be absent or a few may occasionally be present. Seemingly the relationship with the *Caecilia tentaculata* and *C. nigricans* occurring also in Panamá (Darién) is distant. I regard the Panamanian *ochrocephala* formerly associated with *Caecilia*, as a member of the genus *Oscacilia*.



FIG. 4. *Caecilia roleani* sp. nov. A. Subdermal scales from connective tissue. B-C. Dorsal scales from near middle of body. D-F. Scales from four centimeters anterior to terminus of body. G-H. Dorsal scales from last centimeter of body. All scales enlarged to same extent. Actual size of two largest, 1.9×2.1 mm (G) and 2.0×2.15 mm (H). The subdermal scales measure 0.17 to 0.25 mm.

KEY TO CAECILIANS KNOWN IN PANAMÁ AND THE CANAL ZONE

1. Four dental series present 2
 Three dental series present (no splenials) 8
2. Eye covered solidly by bone, visible or invisible externally 3
 Eye in an open socket, visible (or invisible) externally 5
3. Head yellowish; body generally slender, the width in length, 40-60 times; grooves of primary folds edged with black; primaries, 169-189; secondaries, 16-31 *Osaecilia ochrocephala*
 Head not yellowish; body plumper, the width in length, less than 40 times; grooves not distinctly black-bordered 4
4. Primary folds about 119-133; secondaries, 97-117; width in length, 23-32 times. Pacific drainage *Gymnopsis multiplicata*
 Primary folds, about 112-124; secondaries, 94-107; width in length, 19-30 times. Atlantic drainage from Nicaragua, Costa Rica and Panamá
 *Gymnopsis proxima*
5. Very large species (to approximately 1000 mm) 6
 Medium large to small species, 300-600 mm 7
6. Primary folds, 108-145; secondaries, 12-37; body width in length, 22-52 times *Caecilia tentaculata*
 Primary folds, 150-186; secondaries, 28-62; length in width, 42-66 times
 *Caecilia nigricans*
7. Medium large size (600 mm); primaries 226-231; no secondaries; width in length, 83-89 times *Caecilia elongata*
 Length under 300 mm; primaries, 112-124; secondaries, 14-32; splenials, 2-2; width in length, about 30-36 times *Caecilia volcani*, sp. nov.
8. Secondaries reduced (13); primaries to 92; size small (210 mm); width in length, about 22 times *Dermophis parviceps*
 Secondaries more numerous, 40 or more 9
9. Venter white or slightly clouded; primaries, 89-91; secondaries, 40-45; width in length, 21-24 times *Dermophis balboai*
 Venter variable 10
10. On venter and often on sides each fold barred with black; length to 600 mm; width in length, 15-23 times, primary folds, 99-112
 *Dermophis mexicanus mexicanus*
 Venter light, plumbeous to grayish olive; primaries, 91-98; secondaries, 68-78; reaches a length of 345 mm *Dermophis gracilior*

TABLE 1. Data and measurements in mm on *Caecilia volceni* sp. nov.
(All specimens in FHT-HMS Collection; from El Valle de Antón, Coclé, Panamá.)

Number	Type 4689 ♂	4690	4691	4692	4693	4694	4695	4696*	4697*	4697A*
		Total length	283.	254.	303.	324.	295.	310.	284±	239+
Head width	7.6	7.	7.4	8.2	7.	8.	7.2	7.8	5.	
Body width	10.5	8.6	9.8	9.	8.	9.4	8.2	9.	5.	
Length ÷ width	30.5	30.	30.	36.	37.	33.				
Eye to tentacle	3.6	2.8	3.4	3.8	3.6	3.6		3.6	2.1	
Tentacle to nostril	1.4	1.1	1.3	1.6	1.2	1.6		1.3	0.7	
Primary folds	124.	119.	117.	119.	120.	112.		91+		
Secondary folds	32.	21.	17.	19.	20.	14.				
Prcmax.-max. teeth	12-1-12	9-1-9	10-1-10	9-1-9	9-1-9	12-1-12	10-1-10	9-1-9	10-1-10	
Prcvom. palatine	9-1-9	8-1-8	10-1-10	11-1-11	9-1-9	10-1-10	9-1-9	10-1-10	8-1-8	
Dentary	10-10	10-10	10-10	11-11	10-10	11-11	9-10	10-10	9-9	
Splenic	2-2	2-2	2-2	2-2	2-2	2-2	2-2	2-2	1-1	

* Body injured